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REMARKS

In the Office Action, the Examiner rejected Claim 8, which was the only claim then pending, under both 35 U.S.C. 103 and 112. Claim 8 was rejected under 35 U.S.C. 103 as being unpatentable over U.S. Patent 5,777,773 (Epworth, et al.), and the claim was rejected under 35 U.S.C. 112 as failing to comply with the enablement requirement.

Both rejections of Claim 8 are respectfully traversed. Also, new independent Claim 21 is being added to present an independent claim of intermediate scope, and Claim 22, which is dependent from Claim 21, is being added to describe preferred features of the invention. The specification is being amended to include a description that more closely matches the specific terminology used in Claim 8.

For the reasons discussed below, the Examiner is respectfully requested to reconsider and to withdraw the above-identified rejections of Claim 8, and to allow Claims 8, 21 and 22.

The present invention, generally, relates to methods and systems for modulating the optical signals transmitted within an optical network to encode control information in those optical signals.

As discussed in the present application, recent advances in dense wavelength division multiplexing fiber optic networks have led to interest in developing the means to switch optical wavelengths directly, rather than indirectly via optical-to-electrical-to-optical conversions. Also, the basis of wavelength switching is the ability of network devices to transmit their state and reachability information inband over the network.

Because of this, there is a great deal of control information passing around the network. One approach to handling this volume of information is to dedicate a separate control wavelength

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on the network to carry the information. This, though, makes that one wavelength unavailable for network traffic, among other disadvantages.

The present invention addresses this difficulty by carrying the control information redundantly over wavelengths that are also carrying data. More specifically, in accordance with a preferred embodiment of this invention, one wavelength modulation is used for the control data, and another modulation scheme is used for network data not related to network management functions.

Claim 8 is directed to one aspect of the preferred embodiment of the invention – how to encode specific data values into the optical signal. As described in Claim 8, this involves three separate steps: (i) a look-up table is provided having wavelength differences associated with data values, (ii) a wavelength difference for a specific data value is obtained from this look-up table, and (iii) that data value is encoded in the optical signal by establishing that obtained wavelength difference between the center wavelength of the optical signal and the center wavelength of a filter mechanism.

In rejecting Claim 8 under 35 U.S.C. 112, the Examiner argued that the specification fails to provide an enabling disclosure for these three steps. Applicants respectfully disagree. Steps (i) and (ii) – providing the look-up table, and obtaining a wavelength difference from that table – are self explanatory, and do not need any detailed discussion. Those of ordinary skill in the art are able to practice these two steps without a thorough explanation.

With respect to step (iii) – encoding the data value – any suitable procedure may be used to do this. What is important is <u>what</u> is encoded, not how it is encoded. With regard to Claim 8, <u>what</u> is encoded is the data value represented by the wavelength obtained from the look-up table.

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Moreover, the present application, for example on pages 5 and 6, describes in detail one suitable procedure for modulating the wavelength of the optical signal to encode data therein. With reference to Figure 2 of this application, the wavelength of a laser diode 22 is controlled by a circuit for a source 24, and the laser voltage bias is modulated by a dithering current from signal generator 26. Variations in the laser bias produce a corresponding dither in the center wavelength of the laser output 30. This modulation, and in particular, the difference between this center wavelength of the laser and the center wavelength of a filter mechanism, represents the encoded data.

In view of the above-discussion and the explanation of the invention given in the specification, the present application fully enables the subject matter of Claim 8. The Examiner is, accordingly, respectfully requested to reconsider and to withdraw the rejection of Claim 8 under 35 U.S.C. 112.

This opportunity is being taken to amend the specification, and in particular, the "Summary" section of the application to provide a more express support for the specific terminology used in Claim 8. the language being added to the specification is being taken essentially verbatim from Claim 8, and thus is not new matter.

In addition, it is the above three steps of Claim 8 that distinguish this claim patentably from the prior art, including Epworth, et al.

Epworth, et al. discloses an optical frequency control system in which a feedback signal may be used. Epworth describes a dither induced frequency modulation of a laser source. However, the resulting feedback signal discriminates only that portion of the dither induced amplitude modulation (after passing through the filter), which is in phase quadrature with the

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applied dither (see Abstract for Epworth). Further, Epworth locks the peak of a narrowband component to a filter response curve by driving an error signal to zero (Col. 1, lines 59-60, and Col. 2, lines 19-23). Clearly, then, Epworth, et al. does not disclose or suggest the use of a look-up table to help encode data into an optical signal, as described in Claim 8.

With the present invention, a range of wavelength modulation states may be used to encode data in the changing wavelength - the wavelength may be changed to one of a predetermined number of states depending on the data being transmitted. The use of a look-up table, as described in Claim 8, to associate wavelength differences with data values, helps to achieve this.

The other references of record have been reviewed, and these other references, whether considered individually or in combination, also do not disclose or suggest encoding data values into an optical signal in the manner described in Claim 8.

Because of the above-discussed differences between Claim 8 and the prior art and because of the advantages associated with those differences, Claim 8 patentably distinguishes over the prior art and is allowable. The Examiner is, hence, asked to reconsider and to withdraw the rejection of Claim under 35 U.S.C. 103, and to allow this claim.

For the reasons set forth above, the Examiner is respectfully requested to reconsider and to withdraw the rejection of Claim 8 under 35 U.S.C. 103 and 112, and to allow Claim 8 and new Claims 21 and 22. If the Examiner believes that a telephone conference with Applicants'

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Attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,

John S Sensny

John S. Sensny
Registration No. 28,757
Attorney for Applicants

SCULLY, SCOTT, MURPHY & PRESSER, P.C.
400 Garden City Plaza, Suite 300
Garden City, New York 11530
(516) 742-4343

JSS:gc

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